

ASARCO Air Quality Analysis Protocol

Project Overview

The purpose of the air quality analysis is to demonstrate ASARCO's potential contribution to the existing air quality in Texas, New Mexico, and Mexico from its authorized emissions. Normal modeling practice and procedure should be followed except as noted in the protocol. This analysis is required by Commission order and is unique; that is, some modeling requirements may differ from routine modeling practice for air permit applications.

For this air quality analysis, ASARCO must perform air dispersion modeling for all primary and secondary sources of air contaminants at the site and for all short-term and long-term averaging periods. ASARCO should obtain short-term and long-term Effects Screening Levels (ESLs) for all contaminants that do not have standards, and ensure that the most current ESLs are used in the analysis. ASARCO will not have to demonstrate compliance with the Chapter 111 ground-level concentration standards if the commission repeals the standards before the analysis is due to be submitted to the TCEQ.

ASARCO should obtain available ambient air monitoring data in New Mexico and Mexico within 50 kilometers of the site to use as background concentrations that represent existing air quality. Maximum predicted concentrations from ASARCO may be added to representative background concentrations to predict potential air quality if ASARCO resumes operations.

ASARCO should obtain available ambient air monitoring data in Texas within 50 kilometers of the site to use as background concentrations that represent existing air quality. Maximum predicted concentrations from ASARCO may be added to representative background concentrations to predict potential air quality if ASARCO resumes operations. If ambient air monitoring data for criteria pollutants is not available in Texas within 50 kilometers of the site, ASARCO should develop a stationary source emissions inventory for those criteria pollutants and include those emissions in the modeling analysis.

Plot Plan

ASARCO should provide a plot plan that shows a representation of locations of emission sources and buildings. It is preferred that ASARCO submit the plot plan electronically in either "dwg" or "dxf" formats.

Area Map

ASARCO should provide an area map that shows a representation of the current property line, topography, and location of practicably known schools and ambient air monitors located within 50 kilometers. School is defined in the Texas Health and Safety Code § 382.052 as an elementary, junior high, or senior high school.

Air Monitoring Data

ASARCO should obtain available ambient air monitoring data from Texas, New Mexico and Mexico within 50 kilometers of the site. These data will be used as representative background concentrations of air quality. For short-term (averaging periods of 24-hours or less) standards and ESLs, provide the highest monitored concentrations from data within the most recent three

years. For quarterly and annual standards and ESLs, provide the highest monitored concentrations from complete quarters or years within the most recent three years.

If monitoring data within the past three years are not available for a contaminant that ASARCO would be authorized to emit, older monitoring data from a period when ASARCO facilities were shut down could be used.

Modeling Emissions Inventory

For this air quality analysis, all primary and secondary sources of air contaminants emitted from the site must be included in the site-wide analysis whether authorized by permit-by-rule (standard exemption), standard permit or other new source review permit or authorization. Contaminants include: all pollutants with National Ambient Air Quality Standards (NAAQS) except ozone - e.g. PM₁₀, PM_{2.5}, SO₂, Pb, NO₂, and CO; state regulated pollutants listed in Chapters 111 and 112 of 30 Texas Administrative Code; and pollutants with an Effects Screening Level (ESL).

If ambient air monitoring data for criteria pollutants is not available in Texas within 50 kilometers of the site, ASARCO should develop an emissions inventory for those contaminants and include those emissions in the modeling analysis.

ASARCO should provide a table listing the correlation between source identifications (IDs) used in the analysis and the emission point numbers (EPNs) listed on the permit application Table 1(a).

ASARCO should provide a description of source characterizations used in the analysis and an explanation why those characterizations are appropriate. For example, if an area source representation is chosen, the source should physically be emitting pollutants nearly homogeneously throughout a horizontal plane.

ASARCO should provide justification for any claimed adjustments to predicted concentrations due to certain source characterizations. For example, the modeling adjustment factor for fugitive emissions may be used with the Industrial Source Complex Short-Term (ISCST3) model (third revision) but not with the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). According to AERMOD technical references, AERMOD should be more representative in accounting for turbulence effects related to low wind speeds and stable atmospheric conditions than ISCST3. The TCEQ has not determined if adjustment factors should be developed for AERMOD at this time.

Models Proposed and Modeling Techniques

ASARCO may select ISCST3 version 02035 or AERMOD version 04300. If ISCST3 is selected and predicts the occurrence of a re-circulation cavity on the leeward side of a structure that extends off-property, then ISC-PRIME (Plume Rise Model Enhancement) (version 04269) should be used to predict concentrations for the receptors within the cavity.

Selection of Dispersion Coefficients

ASARCO should provide documentation on how dispersion coefficients for use with ISCST3 were chosen. For AERMOD, ASARCO should provide documentation for the choice of albedo, Bowen Ratio, and roughness length.

Building Wake Effects

For ASARCO sources only, provide a table listing all downwash structures used in the modeling demonstration and the associated building/tier heights.

Terrain

If ASARCO chooses to use ISCST3, then the flat terrain option should be used when modeling fugitive emissions and the complex terrain option should be used when modeling stacks. Predicted concentrations resulting from fugitive sources should be added to the predicted concentrations resulting from stacks.

If ASARCO chooses to use AERMOD, then terrain should be included for all sources, buildings, and receptors.

Receptor Grid

ASARCO should develop a receptor grid that extends 50 kilometers from the ASARCO site for all modeling runs. Receptors should be placed in Texas, Mexico, and New Mexico. All identified schools and ambient air monitors within 50 kilometers in Texas, Mexico, and New Mexico should be modeled as discrete receptors. ASARCO should place additional discrete receptors around the school and monitor receptors per standard modeling guidance.

Meteorological Data

ASARCO should use all available on-site meteorological data for criteria pollutant (NAAQS) modeling. For all other modeling, ASARCO should use the on-site meteorological data from 1976. If AERMOD is used, ASARCO should provide documentation on how these data were formatted for use in AERMOD and what adjustments, if any, were made.

Modeling Results

ASARCO should provide results in maps and tables for each modeled contaminant and for each applicable short-term and long-term averaging period. The maps and tables should include the applicable standard or ESL, overall maximum predicted concentrations anywhere off-property, predicted maximum concentrations at the location of each identified school and ambient air monitor located within 50 kilometers, and representative observed concentrations at the monitor locations. For short-term ESLs, the maps and tables should include both magnitude and frequency of exceedance information.

If the results of the analysis show that a standard or ESL could be exceeded when the ASARCO maximum predicted concentration is added to a monitored background concentration, ASARCO should discuss whether the prediction is not representative due to meteorological factors and should be excluded. ASARCO should then provide the highest representative concentration to be used in the analysis.

If non-ASARCO sources are included in the criteria pollutant modeling analysis, ASARCO should provide a source contribution analysis that separates the ASARCO contribution from the total contribution.

Documentation

ASARCO should provide all calculations and supporting information used to derive or determine all modeling input values and parameters and should justify all modeling techniques.

In addition, ASARCO should provide all electronic files used as input for the model or generated as a result of performing the air quality analysis and a table listing each file name, contaminant, and air quality review type associated with each electronic file. If the modeling analysis involves multiple operating scenarios, ASARCO should specify which files are associated with each scenario.